We claim:

1. A self-assembled lipid bilayer material comprising a plurality of lipid bilayer molecules in a columnar structure with self-limiting radial dimension mediated by chemical recognition events.
2. The self-assembled lipid bilayer material of Claim 1 wherein the lipid bilayer molecules in a columnar structure have diameters in the range between approximately 600 Angstroms and approximately 900 Angstroms.
3. The self-assembled lipid bilayer material of Claim 1 wherein the columnar structure is greater than approximately 300 Angstroms in length.
4. The self-assembled lipid bilayer material of Claim 1 wherein the material is stable is aqueous solutions.
5. The self-assembled lipid bilayer material of Claim 1 wherein a ligand is situated between said lipid bilayer molecules, said ligand promoting adhesion between said lipid bilayer molecules.
6. The self-assembled lipid bilayer material of Claim 5 wherein said ligand has at least two bindings sites accessible from opposite sides of the ligand.
7. The self-assembled lipid bilayer material of Claim 1 wherein said ligand is a cation.
8. The self-assembled lipid bilayer material of Claim 1 wherein said ligand is a copper cation.
9. The self-assembled lipid bilayer material of Claim 1 wherein said lipid bilayer molecules are functionalized with a receptor molecule.
10. The self-assembled lipid bilayer material of Claim 1 wherein said receptor molecule is iminodiacetic acid.
11. The self-assembled lipid bilayer material of Claim 1 wherein molecules selected from proteins, polymers and metal oxides are intercalated between said lipid bilayer molecules.
12. A method for making a lipid bilayer material, comprising the steps of:

    functionalizing lipid bilayers with a receptor lipid;

preparing a lipid bilayer suspension of the functionalized lipid molecules mixed in a matrix lipid; and

adding a ligand specific for said receptor lipid to form a lipid bilayer material.

13. The method of Claim 12, wherein said receptor lipid has a headgroup functionality that binds to said ligand.

14. The method of Claim 12, wherein said receptor lipid has from 1 to 4 hydrophobic tails.

15. The method of Claim 12, wherein said receptor lipid self-assembles to form lamellar structures in an aqueous solution.

16. The method of Claim 13, wherein said ligand has a plurality of binding sites.

17. The method of Claim 12, wherein said lipid bilayer has a geometry selected from a closed spherical form and a flat disc.

18. A method of preparing a lipid bilayer material, comprising:

dissolving distearylphosphatidylcholine in a solvent to yield a first solution;

dissolving 1-octadecyl-2-(9-(1-pyrene)nonyl)-rac-glycero-3-(8-(3,6-dioxy)octyl-1-amino-N,N-diacetic acid) is a solvent to yield a second solution;

mixing said first solution with said second solution;

removing solvent to form a homogenous lipid film;

adding a solution of morpholinepropanesulfonic acid to yield a third solution;

vortexing said third solution to form a suspension solution;

separating said suspension solution to yield a supernatant component; and

adding a solution of $CuCl_2$ in a NaCl aqueous solution, wherein the resultant solution self-assembles to form a lipid bilayer material with a columnar structure.